

(54) Title

COOKED FOOD PRODUCT FOR MICROWAVE COOKING

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(57) Claim

1. A process for preparing a food product cookable with microwaves to produce a microwave cooked food product which has a crisp coating, comprising:

(a) applying a predust comprising:

- (i) 45 - 98wt% flour;
- (ii) 27.5 - 1.0wt% coating agent; and
- (iii) 27.5 - 1.0wt% edible gum;

to the surface of a foodstuff;

(b) applying a batter comprising:

- (i) 5 - 60wt% thickener;
- (ii) 1 - 50wt% filling agent; and
- (iii) 25 - 94wt% water;

to the surface of the predusted foodstuff; and

(c) frying the battered foodstuff at an effective temperature and for an effective time thereby providing the food product.

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COMPLETE SPECIFICATION

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Complete Specification for the invention entitled:

Process of Preparing a Food Product

The following statement is a full description of this invention, including the best method of performing it known to me/us

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TECHNICAL FIELD

This invention relates to a process for preparing a food product which can be cooked with microwaves, a process for preparing a cooked food product which has been cooked with microwaves and a food product and cooked food product prepared by the above processes.

BACKGROUND ART

The use of microwave ovens for food processing, cooking and reheating has increased in popularity over the years. Food cooked or heated with microwaves has similar nutritional quality as food cooked or heated by other means.

Over the years, several methods have been developed for the processing and storage of food products. These have included comminution and smoking of meat products, canning, dehydration and freezing of food products.

Freezing and thawing is tolerated by many processed foods and certain animal products. The useful life of foods can be prolonged by storage at lowered temperatures. Lower temperatures also reduce the rate of loss of colour, flavour, structure and nutrients in foods.

Freezing is not recommended for most fruits and vegetables because their rigid cell structures can not accommodate ice crystal formation and significant structural quality is lost. Meat, on the other hand, can be kept at low temperatures for many months. However meat structure is affected by freezing and thawing.

Frozen meat must be packaged so that the packaging system clings closely to the surface of the product. This restricts movement of moisture from the surface of the product as well as restricting the diffusion of oxygen into the product. The use of this packaging system prevents freezer burn or dehydration and discolouration of the product.

Food products which are crumbed or battered and cooked by the conventional methods, not with microwaves, usually have a crispy and crunchy texture on their surface.

To date no single battered and crumbed microwaveable product is available on the market in a self contained state. By this it is meant that the range of current coated microwaveable products depend upon various packaging formats to produce a suitable product. These products, even using the special packaging provided, are of poor quality compared to those prepared and accepted by customers by more conventional methods. To date

most similar work has been restricted to fish applications, but these all depend on systems of packaging.

There is a need for crumbed or battered food products which do not require packaging in special containers which allow for microwave application.

5 OBJECTS OF INVENTION

It is an object of this invention to provide a process for preparing a food product which can be cooked with microwaves.

Another object is to provide a process for preparing a cooked food 10 product which has been cooked with microwaves.

Other objects are to provide food products and cooked food products prepared by the above processes.

DISCLOSURE OF INVENTION

According to a first embodiment of this invention there is provided a 15 process for preparing a food product cookable with microwaves to produce a microwave cooked food product which has a crisp coating, comprising:

- (a) applying a predust comprising:
 - (i) 45 - 98wt% flour;
 - (ii) 27.5 - 1.0wt% coating agent; and
 - (iii) 27.5 - 1.0wt% edible gum;
- 20 to the surface of a foodstuff;
- (b) applying a batter comprising:
 - (i) 5 - 60wt% thickener;
 - (ii) 1 - 50wt% filling agent; and
 - (iii) 25 - 94wt% water;
- 25 to the surface of the predusted foodstuff; and
- (c) frying the battered foodstuff at an effective temperature and for an effective time thereby providing the food product.

According to a second embodiment of this invention there is provided 30 the process of the first embodiment and further including:

(d) cooking the food product with microwaves for an effective time thereby providing a cooked food product having a crisp coating.

According to a third embodiment of this invention there is provided a food product when prepared by the process of the first embodiment.

35 According to a fourth embodiment of this invention there is provided a cooked food product having a crisp coating when prepared by the process of the second embodiment.

Typically a process of preparing a food product which can be cooked with microwaves, comprises:

- (a) applying a predust comprising:
 - (i) 45 - 80wt% flour;
 - (ii) 25 - 3wt% coating agent;
 - (iii) 25 - 3wt% edible gum;
 - (iv) 2 - 17wt% salt;
 - (v) 2 - 20wt% sweetening agent; and
 - (vi) 1 - 12wt% flavour enhancer;
- to the surface of a foodstuff;
- (b) applying a batter comprising:
 - (i) 5 - 45wt% thickener;
 - (ii) 2 - 30wt% filling agent;
 - (iii) 25 - 70wt% water;
 - (iv) 0.5 - 8wt% salt;
 - (v) 0.5 - 10wt% mineral salts; and
 - (vi) 0.1 - 5wt% spice and/or spice extracts to the surface of the predusted foodstuff; and

(c) frying the battered foodstuff at an effective temperature and for a sufficient time to provide the food product which can be cooked with microwaves to produce a cooked food product which has a crisp coating.

The battered foodstuff can be crumbed prior to frying. It is particularly advantageous to utilize Japanese style breadcrumbs which are a textured extruded material made from rice flour, wheat flour, soya flour, salt; vegetable oil; dextrose and colouring agent. The main attribute of this type of crumb is enhanced crispness and mouthfeel due to its process of manufacture.

The foodstuff is typically fish, prawns, oysters, scallops, calamari, kangaroo, buffalo, veal, chicken, beef, pork, lamb or other like meats, value added products such as reformed chicken, beans, eg soya beans, pork, fish, beef, sausages, fruit such as bananas, tomatoes and pineapples, vegetables such as potatoes, zucchinis, carrots, capsicums, pumpkins and squash as well as soya meat substitutes and other meat substitutes.

The time and temperature required to fry the battered foodstuff can vary depending on the compositions of the predust, batter and crumbs. A typical time range is from 40 to 80 secs. A typical temperature range of frying is between 160°C to 210°C. The cooking time selected will determine

product colour development, oil penetration and the amount of precooking of the food product. Saturated or polyunsaturated oils can be used for the flash frying process.

The flour used for the predust can be wheat flour, soya flour, rye flour, corn flour, rice flour, millet flour, sorghum flour, maize flour, barley flour, oat flour, triticale flour or mixtures thereof or other like flours. Wheat flour is the preferred flour for the predust formulation.

The salt used in the predust and the batter can be selected from the group consisting of sodium chloride, potassium chloride, magnesium sulphate, potassium sulphate or sodium sulphate or mixtures thereof or other like salts. Sodium chloride is preferred for both the predust formulation and the batter formulation.

The mineral salts used in the batter can be selected from the group consisting of sodium pyrophosphate, ammonium, sodium and potassium carbonates and bicarbonates, calcium and magnesium carbonates, calcium chloride, calcium oxide, potassium hydrogen tartrate, sodium, potassium and calcium salts of ortho phosphoric acid, sodium and potassium metabisulphites, sodium and potassium polyphosphates, potassium pyrophosphates, magnesium sulphate, potassium chloride, sodium sulphate, potassium sulphate.

The coating agent used in the predust can be selected from the group consisting of egg albumin or lactalbumin.

The edible gum in the predust can be selected from the group consisting of guar gum, karaya gum, tragacanth gum, agar-agar, gum acacia, algin, alginic acid and its sodium potassium and ammonium salts, carrageenan, furcellaran, carob bean gum, arabinogalactan, gellan gum, xanthan gum, pectin, oat gum, methylcellulose, carboxymethylcellulose, hydroxy propyl methylcellulose or mixtures thereof or other like gums. Preferably guar gum is used in the predust formulation.

The thickener used in the batter can be selected from the group consisting of acetylated distarch adipate, acetylated distarch phosphate, bleached starches, gelatine, mono acid distarch phosphate, natural starches, oxidized starches, phosphated distarch phosphate, pregelatinised starches, dextrinised starches, starch acetate or mixtures thereof or other like thickeners. Natural starch is used in the batter.

The filling agent used in the batter can be wheat flour, high protein wheat flour, soya flour, rye flour, corn flour, rice flour, millet flour,

sorghum flour, maize flour, barley flour, oat flour, triticale flour or mixtures thereof or other like flours. The filling agent used in the batter can also be casein, milk proteins, soya milk proteins, soya protein, yeast, leaf protein concentrate, fish protein concentrate, synthetic protein, or mixtures thereof or other like protein. Soya protein is typically used in the batter.

The sweetener used in the predust can be selected from the group consisting of dextrose, sucrose, lactose, corn syrup, honey, glucose, fructose, cyclamate, saccharin, aspartame, maltose, mannitol or mixtures thereof or other like sweeteners. Dextrose is typically used in the predust formulation.

The flavour enhancers used in the predust can be selected from the group consisting of MSG, fruit flavours, peppermint flavour, vinegar, mustard, tomato, horseradish, nut flavours, coloring or mixtures thereof or other like flavour enhancers. Spices can be selected from the group consisting of pepper, nutmeg, coriander, peppermint, mints, oregano, cinnamon, tumeric, saffron, curry, mustard or mixtures thereof or other like spices. MSG and pepper are typically used but will vary with individual customer needs.

The oil used for the flash frying process can be selected from the group consisting of butter, margarine, safflower oil, soya bean oil, olive oil, peanut oil, sesame oil, arachis oil, coconut oil, cocoa butter, groundnut oil, fish oils, maize oil, wheat germ oil, sorghum oil, rice bran oil, sunflower oil, walnut oil, fruit oil or mixtures thereof or other like oils. The prepared product is typically flash fried in vegetable oil.

After cooking and cooling, the prepared product is frozen and/or packed. Foods can be frozen in air or in direct immersion freezing media such as food grade dichloro difluoro methane, nitrous oxide and water solutions of various edible salts, sugars, alcohols, acids, and esters. Other freezing methods include conduction freezing between chilled plates, direct immersion in liquid nitrogen, exposure to solidified carbon dioxide, and immersions of packaged products in liquid freezants such as sodium or calcium chloride brines, methanol or propylene glycol solutions.

Packaging of food products provide a barrier which protect preserved foods from spoilage during storage and distribution. Preferred packaging materials include paper, plastics, aluminium or combinations of these materials. Suitability of packaging materials is determined from studies

of storage conditions over a range of temperatures, relative humidities and handling conditions.

5 The time required for cooking the prepared food product in a microwave oven will depend on the type of product, the size and thickness, the meat spices and the size and type of oven.

An advantage of the process of the invention is that its application allows a frozen or chilled, battered and/or crumbed food product to be cooked with microwaves from its packaged state to edible temperature without the external batter and crumbs becoming soft and moist.

10 Another advantage is that a food product of the invention doesn't require special packaging for cooking since it is directly microwaveable.

A further advantage is that a process of the invention can be applied to all meat types, reformed products, some fruit and vegetables. The batter may be flavoured to suit customer needs.

15 Another advantage is that the coating on a cooked food product of the invention is crisp and crunchy, providing excellent mouthfeel, flavour and consequently customer acceptance.

BEST MODE AND OTHER MODES FOR CARRYING OUT THE INVENTION

20 A cooked food product of the invention can be prepared in the following manner:

1. A predust with the composition of

69.6wt% wheat flour, 13.6wt% sodium chloride, 5.0wt% egg albumin, 5.0wt% guar gum, 3.4wt% dextrose and 3.4wt% MSG is applied to either chilled, fresh or frozen foodstuffs.

25 The purpose of the predust is two fold:

- 1) to absorb any surface moisture on the product to be battered;
- 2) to provide a better adhesion between the product and the applied batter.

The predust is critical for the cooked food product because it inhibits moisture migration to the batter and hence assists in keeping the product crisp and firm.

30 2. The foodstuff which has been pre-dusted is battered. The batter is an ovenable batter which helps the cooked food product retain its moisture. The composition of the pre-prepared batter is 28.4wt% starch, 6.4wt% soya protein, 0.7wt% sodium chloride, 1.07wt% sodium pyrophosphate/sodium bicarbonate, 0.37wt% pepper and 62.98wt% water.

35 3. The crumbing of the battered food product with a Japanese style

breadcrumb called J Crumb which is manufactured by several companies all producing J Crumb with similar properties, completes the preparation stage. This is a pre-fabricated product and is not a bread crumb. These crumbs are a textured, extruded material which enhance crispness and 5 mouthfeel due to its process of manufacture.

4. The food product is then fried in vegetable oil at 195°C. for 60 seconds.

5. Following cooling the product may be frozen and/or packed.

10 The preparation of the food product for consumption involves the following procedure:

- . Remove from package.
- . Place product on a plate lined with kitchen paper (optional).
- . A preferred process for cooking a frozen 110gm chicken breast fillet is:
 - (a) cook for 2 minutes;
 - (b) flip over;
 - (c) cook for another 2 minutes or until product is totally cooked.

The cycle is applicable for a 800 kw microwave oven.

- . Product should be served soon after cooking.
- . The product may be refrigerated and re-cooked if necessary.

INDUSTRIAL APPLICABILITY

The process of the invention provides a food product which can be frozen or chilled and then cooked with microwaves to yield a cooked food product with a crisp coating.

The claims defining the invention are as follows:

1. A process for preparing a food product cookable with microwaves to produce a microwave cooked food product which has a crisp coating, comprising:
 - (a) applying a predust comprising:
 - (i) 45 - 98wt% flour;
 - (ii) 27.5 - 1.0wt% coating agent; and
 - (iii) 27.5 - 1.0wt% edible gum;to the surface of a foodstuff;
 - (b) applying a batter comprising:
 - (i) 5 - 60wt% thickener;
 - (ii) 1 - 50wt% filling agent; and
 - (iii) 25 - 94wt% water;to the surface of the predusted foodstuff; and
 - (c) frying the battered foodstuff at an effective temperature and for an effective time thereby providing the food product.
2. The process of claim 1 further comprising:
 - (c)(i) freezing said fried foodstuff.
3. The process of claim 1 or 2 further comprising:
 - (d) cooking the food product with microwaves for an effective time thereby providing a cooked food product having a crisp coating.
4. The process of any one of claims 1 to 3 wherein the predust comprises:
 - (i) 45 - 80wt% flour;
 - (ii) 25 - 3wt% coating agent;
 - (iii) 25 - 3wt% edible gum;
 - (iv) 2 - 17wt% salt;
 - (v) 2 - 20wt% sweetening agent; and
 - (vi) 1 - 12wt% flavour enhancer.
5. The process of any one of claims 1 to 4 wherein the predust comprises: 69.6wt% wheat flour, 13.6wt% sodium chloride, 5.0wt% egg albumin, 5.0wt% guar gum, 3.4wt% dextrose and 3.4wt% MSG.
6. The process of any one of claims 1 to 5 wherein the batter comprises:
 - (i) 5 - 45wt% thickener;
 - (ii) 2 - 30wt% filling agent;
 - (iii) 25 - 70wt% water;
 - (iv) 0.5 - 8wt% salt;
 - (v) 0.5 - 10wt% mineral salts; and
 - (vi) 0.1 - 5wt% spice and/or spice extracts.

7. The process of any one of claims 1 to 5 wherein the batter comprises: 28.4wt% starch, 6.4wt% soya protein, 0.7wt% sodium chloride, 1.07wt% sodium pyrophosphate/sodium bicarbonate, 0.37wt% pepper and 62.98wt% water.
8. The process of any one of claims 1 to 7 further comprising:
(b)(1) crumbing the battered foodstuff prior to step (c)
9. The process of claim 8 wherein breadcrumbs are used in said crumbing.
10. The process of claim 9 wherein said breadcrumbs are Japanese style breadcrumbs.
11. The process of any one of claims 1 to 10 wherein said effective temperature is between 160 -210°C.
12. The process of any one of claims 1 to 11 wherein said effective time is 40 - 80secs.
13. The product of the process of any one of claims 1 - 12.

DATED this SEVENTH day of MAY 1990

Lindgren Pty. Ltd.

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